UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/061,542	10/25/2001	Annette M. Crevasse	CREVASSE 52-104-78-8	2716

27964 7590 05/02/2003

HITT GAINES & BOISBRUN P.C.
P.O. BOX 832570
RICHARDSON, TX 75083

EXAMINER
TRAN, BINH X

ART UNIT	PAPER NUMBER
1765	7

DATE MAILED: 05/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/061,542	CREVASSE ET AL.	
	Examiner	Art Unit	
	Binh X Tran	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 February 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) ~~*1-21*~~ is/are pending in the application.

4a) Of the above claim(s) ~~*1-7,*~~ *10 and 18* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8,11-16 and 19-21* is/are rejected.

7)☒ Claim(s) *9 and 17* is/are objected to.

8)☒ Claim(s) *1-21* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 8-9, 11-14, 15-17, 19-21 in Paper No. 6 is acknowledged.

2. Claims 1-7 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Claims 10, 18 are withdrawn from further consideration, as being drawn to a nonelected species.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 8, 11-13, 15-16, 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lu et al. (US 6,524,959) in view of Birang et al. (US 6,537,133).

Lu discloses a method of determining a polishing endpoint comprising:

emitting the first signal (22) from an emitter (20) located at first location and causing the first signal to pass through a polished film (18, 16, 14, 12) located on a semiconductor wafer (10) and thereby provide a second signal (24b-24e) having an intensity;

receiving the second signal (24b-24e) emanating from the film with a receiver (26) at the second location (i.e., located at another location) (Fig 1);

determining a polishing endpoint for the film as a function of change of intensity of the second signal (Fig 2-3, col. 8 lines 20-45).

Lu does not explicitly disclose the endpoint was based on a function of a change in intensity between the first and the second signals. However, Lu clearly discloses that the endpoint was determined by the change in intensity of the second signal. Since the intensity of the first signal (22) from the radiation beam source (20) is constant, any person in the art would understand that the change in intensity of the second signal with the constant in intensity of the first signal is equivalent with the change in intensity between the first and the second signals.

Lu fails to disclose that the intensity of second signal is less than the intensity of the first signal. In the polishing endpoint process using two signals, Brang discloses the second signal has a signal-to-noise ratio due to vibration from of the platen and wafer (col. 9 lines 13-35). Since the second signal has a noise and there is no amplifier for the second signal, the intensity of the second signal by itself must be less than the intensity of the first signal. It would have been obvious to one having ordinary skill in the art, at the time of invention, that the intensity of the second signal is less than the intensity of the first signal due to unavoidable signal-to-noise problem.

Lu also fails to explicitly disclose the exact location of the emitter (20) and the receiver (26). However, Lu clearly discloses the emitter (20) and the receiver (26) located at different location (Fig 1). Birang discloses the emitter (44) and receiver (48)

at different location either adjacent to one of the carrier head (12) or polishing platen (16). It would have been obvious to one having ordinary skill in the art, at the time of invention, to locate the emitter and the receiver adjacent to one of the carrier head and the polishing platen because it is the closest and most accurate place to measure the signal intensity.

Respect to claim 11, Lu discloses the first signal comprised of acoustic waves (col. 7 lines 7-9). Respect to claim 13, Lu disclose the acoustic wave having a plurality of wavelength (col. 7 lines 5-15). Since the frequency of the signal directly depend on the frequency, the examiner will interpret that Lu implicitly disclose the acoustic wave has plurality of frequency.

Respect to claim 12, Lu fails to disclose the first signal comprised of ultrasonic acoustic wavelength. However, Lu clearly discloses the use of acoustic wavelength. Birang disclose that ultrasonic wavelength has been used in the art to detect endpoint (col. 2 lines 25-27). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Lu in view of Birang by using ultrasonic wavelength because equivalent and substitution of one for the other would produce an expected result.

Respect to claim 15, Lu further discloses the step of:

forming an integrated circuit layer (12-18) on a semiconductor wafer (10);

polishing the integrated circuit layer with a polishing apparatus;

striking the first signal on the integrated circuit to create a second signal (Fig 1).

All of the other limitation of claim 15 has been discussed above. Respect to claim 16, Lu discloses the second signal (24b-24e) is a resulting signal from the first signal striking the integrated circuit layer (Fig 1). The limitation of claims 19-20 has been discussed above.

5. Claims 14 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lu and Birang in view of Tzeng (US 6,028,669).

Respect to claims 14 and 21, both Lu and Birang fail to disclose the polishing endpoint is based on a function of a change of a signal wavelength or signal amplitude between the first and second signals. However, Lu clearly discloses that the polishing endpoint is based on a function of a change in signal intensity. In a polishing process, Tzeng discloses that the polishing endpoint is based on a function of change of the magnitude (i.e., intensity) with directly depend on signal amplitude (col. 6 lines 25-48). It would have been obvious to one having ordinary skill in the art, at the time of invention to modify Lu and Birang in view of Tzeng by determining the endpoint on the amplitude because it easy to calculate base on the signal intensity.

Allowable Subject Matter

6. Claim 9, 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh X Tran whose telephone number is (703) 308-

1867. The examiner can normally be reached on Monday-Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin L Utech can be reached on (703) 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Binh X. Tran
April 29, 2003

BENJAMIN L. UTECH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700